

Marine Isopoda from the Rocky Shore of Osaka Bay, Middle Japan (1)\*

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大阪湾沿岸岩礁海岸産等脚目 (1)

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1974年度に実施した大阪湾沿岸岩礁動物相調査の際に採集された等脚目甲殻類、および大阪市立自然史博物館所蔵の等脚目甲殻類のうち大阪湾沿岸岩礁海岸産の標本について報告する。なお、有扇亜目コツブムシ科の等脚目については別途報告の予定なので、ここでは割愛した。

今回報告するのは下記の14種で、うち5種は新種である。

Suborder Anthuridea ウミナナフシ亜目

Family Anthuridae スナウミナナフシ科 (新称)

*Leptanthura nigrocaudata*, n. sp. クロオウミナナフシ (新称)

*Apanthura* sp.

Family Paranthuridae ウミナナフシ科

*Colanthura nigra*, n. sp. クロアシタラズウミナナフシ (新称)

*Paranthura laticauda*, n. sp. オビロウミナナフシ (新称)

*Paranthura kobensis*, n. sp. コウベウミナナフシ (新称)

Suborder Asellota ミズムシ亜目

Family Janiridae ウミミズムシ科

*Janiroopsis longiantennata* THIELEMANN ウミミズムシ

Family Parastenetriidae ホソミズムシ科 (新称)

*Caecostenetroides nipponicum* n. sp. ニッポンメナシホソミズムシ (新称)

Suborder Valvifera ヘラムシ亜目

Family Idoteidae ヘラムシ科

*Synidotea hikigawaensis* NUNOMURA ヘリキレワラジヘラムシ

*Cleantis planicauda* (BENEDICT) ホソヘラムシ

*Cleantiella isopus* (GRUBE) イソヘラムシ

*Cleantiella strasseni* (THIELEMANN) オヒラキヘラムシ

*Synisoma pacificum* NUNOMURA クロシオナガヘラムシ

Suborder Oniscoidea ワラジムシ亜目

Family Tylidae ハマダンゴムシ科

*Tylos granulatus* MIERS ハマダンゴムシ

Family Ligidae フナムシ科

*Ligia exotica* ROUX フナムシ

なお本報告で扱った *Paranthura* 属の標本と比較するため、従来記載の不完全であった *Paranthura japonica* RICHARDSON (ヤマトウミナナフシ、新称) の完模式標本をアメリカ合衆国国立博物館より借用、比較した。さらに、同博物館所蔵の別産地のもので同種と認められる雄の個体を解剖し、記載した。

\* Contributions from the Osaka Museum of Natural History, No. 186.

In 1974, a faunal research of the rocky shore of Osaka Bay, Middle Japan, was carried out with a purpose to reveal the biotic condition of intertidal rocky shores of the same bay. During this research, some isopod crustaceans were collected and all of them were placed at my disposal. The present paper is prepared to report on the specimens collected in this research, but also additional descriptions are made on the specimens deposited at the Osaka Museum of Natural History, which had previously been collected from the rocky shore of Osaka Bay, mainly by Mr. I. HAMATANI and Mr. Y. SHIBATA since 1954. In total, 14 species including 5 new species are recorded herein, but the family Sphaeromatidae is excluded to be reported in an another paper later published.

The specimens, preserved in 70% alcohol, were examined in glycerol. All the figures were drawn by using camera lucida.

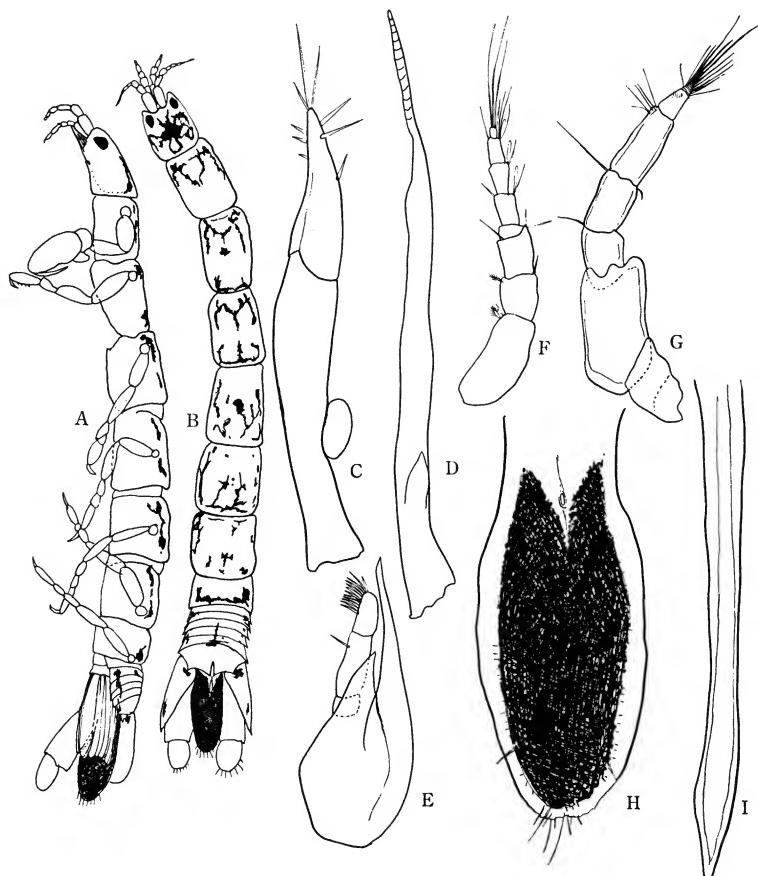


Fig. 1. *Leptanthura nigrocaudata*, n. sp. A. Lateral view. B. Dorsal view. C. Maxilliped. D. First maxilla. E. Mandible. F. First antenna. G. Second antenna. H. Telson. I. Stylus of male second pleopod. (A-H, holotype female; I, male).

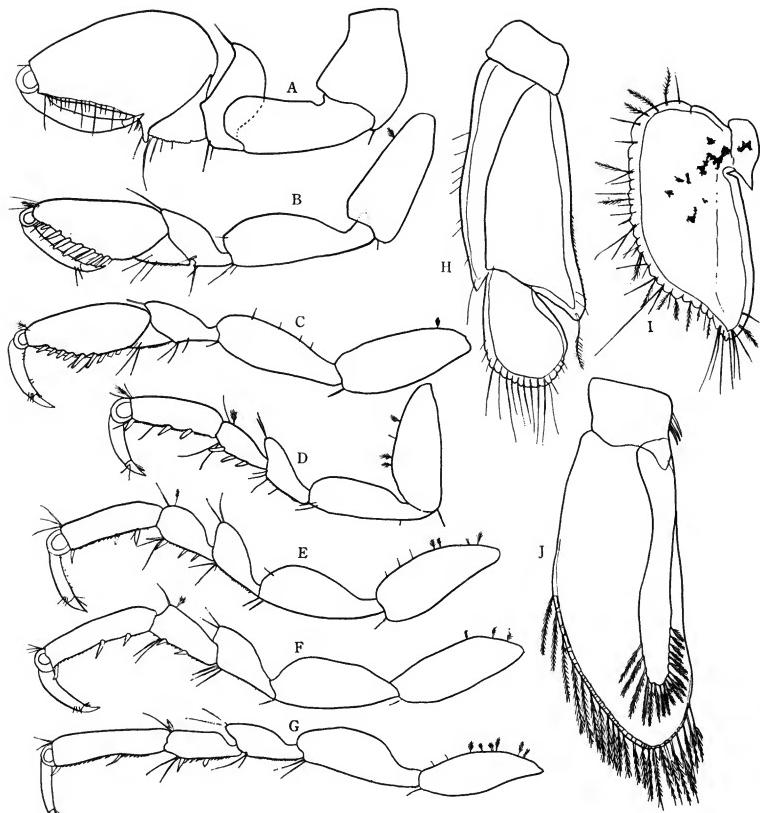


Fig. 2. *Leptanthura nigrocaudata*, n. sp. A-G. Peraeopods I-VII. H. Endopod of uropod. I. Exopod of uropod. J. First pleopod of female. (A-J, female holotype).

oblong with three stout setae and small dentate setae.

First pleopod is bigger than the other and with narrow endopod and wide exopod. Second pleopod of male with a long setiferous stylus. Second to fifth pleopods are similar in female. Exopod of uropod with very sinuate margin. Basal segment of endopod rather wide with a long plumose seta at inner border. Telson, black but marginal part transparent, lanceolate in shape, with about ten setae at the tip. Only one statocyst is found at basal part of telson.

*Materials examined:* 1) 1♂ (holotype, 9.5 mm in body length) intertidal zone rocky shore, Jōgasaki, Kada, Wakayama City, Wakayama Pref. coll. Y. Fukui and Y. Nakajima, Jan. 31, 1975. Type specimen is deposited at the Osaka Museum of Natural History (OMNH-Ar-163). 2) 1♂ (8.3 mm in body length) and 1♀ (7.5 mm in body length), Jōgasaki, Kada, Wakayama City, Wakayama Pref. coll. Y. Nakajima, May 11, 1975. All the specimens were collected among colonies of the coralline alga, *Corallina pilulifera* POSTEL et RUPRECHT.

*Remarks:* So far as I am aware, ten species of the genus *Leptanthura* have been recognized as valid in the world, but nothing in Japan; so the present discovery marks the first record of

Before going further, I wish to express my thanks to Dr. NISHIMURA of the Seto Marine Biological Laboratory for many useful suggestions and reading the manuscript, to Mr. I. HAMATANI, Mr. Y. NAKAJIMA, Mr. Y. FUKUI and Miss Y. INOUE for their kindness in collecting specimens, to Mr. Y. SHIBATA and other members of the Osaka Museum of Natural History for their criticisms and encouragement, and to Dr. T.E. BOWMAN of the U.S. National Museum for his kindness in lending the type and other specimens of *Paranthura japonica*. Last but not least acknowledgement of mine is also due to Hôkoku-sekizenkai in Osaka for the aid of grants for the field research in 1974.

### Family ANTHURIDAE

The family Anthuridae has previously been known from Japan only by a single species, *Cyathura muromiensis* NUNOMURA. In this paper, a new additional species and an unidentified species of this family are reported.

#### *Leptanthura nigrocaudata*, n. sp. (Figs. 1-2)

(Japanese name: Kuro-o-uminanafushi)

*Description:* Body slender, about ten to eleven times as long as wide. Body color whitish dull yellow with irregular black patterns on the dorsal side, only the telson entirely black. First to sixth peraeonal somites similar in length, seventh somite less than half the length of the other somites. Eyes rather large with 11 ocelli. Anterolateral angles of cephalon fairly projected but rostral projection pretty small. Peraeonal somites not pitted. Demarcation of pleonal somites visible in dorsal view. Sixth somites pretty long and with a median cleft.

First antenna composed of eight segments. First and second segments with plumose setae. Fourth segment deeply immersed in distal part of third segment. Fifth to seventh segments with aesthetascs on distal margin.

Second antenna somewhat longer than the first. Second segment still bigger than the other segments.

Mandible with acute apex and three-segmented palp. First segment small. Second segment longest and with a seta. Terminal segment with a row of twelve setae on inner border.

First maxilla very long and with twelve sawlike teeth at apex.

Maxilliped slender with two free segments.

Peraeopods I-III subchelate. Peraeopod I with stout propodus with 20 setae at inner margin. Carpus triangular with sinuate inner margin. Peraeopods II and III slenderer than the peraeopod I. Propodus with eight to nine stout setae on inner margin. Peraeopods IV-VII are all walking legs and similar in shape. Basis long with three to six plumose setae at outer margin. Ischium also long. Merus somewhat smaller and with many fine setae at inner margin. Carpus with two to three stout setae and many small dentate setae. Propodus

the genus in Japan. The new species seems to be allied to *Leptanthura orientalis* BARNARD but differs from it by the following features: (1) black color and shape of telson, (2) with eyes, (3) shape of uropod.

*Apanthura* sp. (Fig. 3)

*Description:* Body, dull yellow in alcohol, slender and about eleven times as long as wide except both antennae. Eyes mediocre, number of ocelli not discerned. Anterolateral

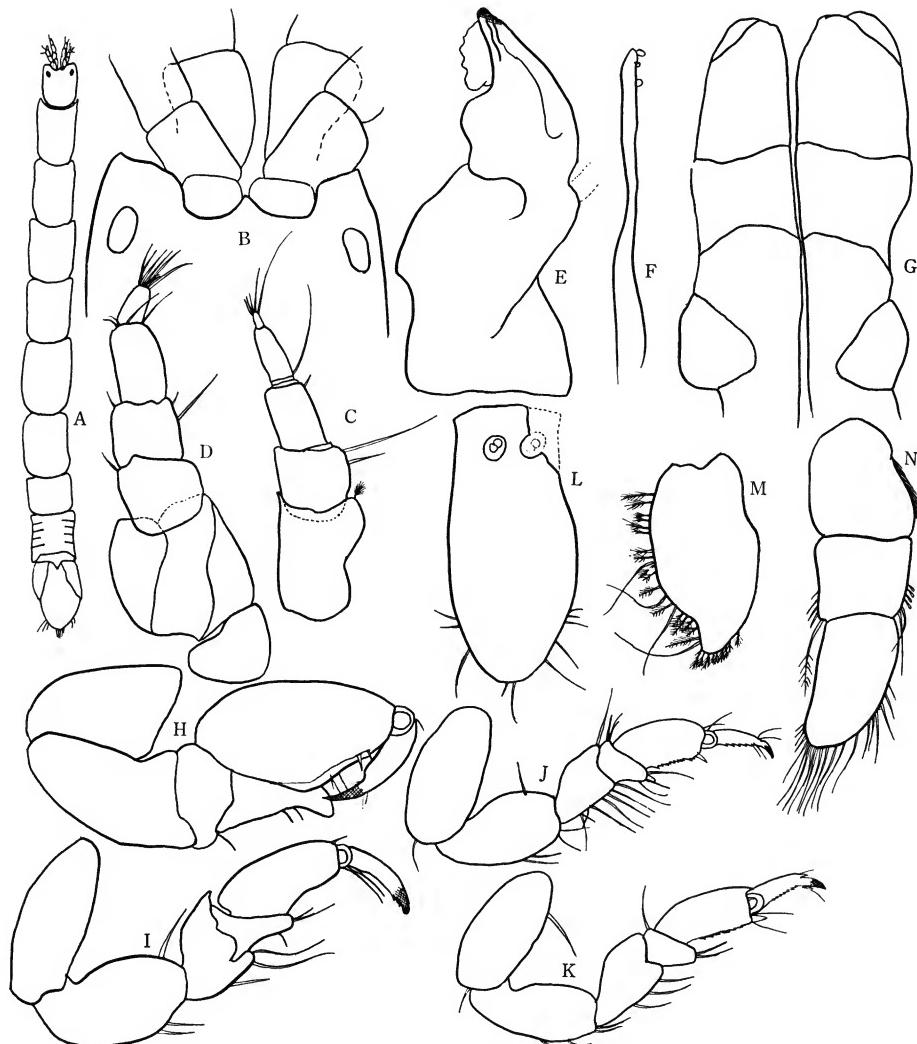


Fig. 3. *Apanthura* sp. A. Dorsal view. B. Anterior part of cephalon. C. First antenna. D. Second antenna. E. Mandible. F. First maxilla. G. Maxilliped. H. First peraeopod. I. Second peraeopod. J. Fourth peraeopod. K. Sixth peraeopod. L. Telson. M. Exopod of uropod. N. Endopod of uropod.

angles very wide and exceeding forward the rostral projection. First to fifth peraeonal somites similar in length. Sixth somite a little shorter than the fifth. Seventh somite about half as long as the fifth. Peraeonal somites not pitted. Demarcation of pleonal somites visible on dorsal view, but fused in medial part. First to fourth pleonal somites similar in length. Fifth somite about three times as long as the fourth. Sixth somite is acute at posterior median cleft. Endopod of uropod extended as backward as the telson.

First antenna composed of five normal-sized segments and about three minute segments, one of which is inserted between the second and third, and the remaining between the third and fourth normal-sized segments.

Second antenna a little longer than the first and consists of six segments. First segment small. Second segment largest and grooved. Third and fourth segments almost square and similar in length. Fifth segment rectangular with about four setae at distal part. Sixth segment slenderer with about eight setae at the tip.

Mandible with stout incisive process bearing three teeth. A thin flange with about five indistinct teeth. Exact molar process is not found. Unfortunately, mandibular palp of both sides were broken.

First maxilla slender with three round projections near the tip.

Maxilliped with four segments but no seta was observed.

Peraeopod I subchelate. Basis and ischium stout and triangular. Merus rectangular with a seta. Carpus triangular with two setae. Propodus big with two stout spines and three setae. Dactylus somewhat stout with a claw.

Peraeopods II and III are similar in shape. Basis and ischium oblong. Merus triangular. Carpus acute triangular. Propodus slenderer than that of peraeopod I. Dactylus with a claw and two or three spines.

Peraeopods IV-VII are similar in shape and only slightly differ from peraeopod II or III; with a little longer merus, dentate margin of propodus and dactylus, and stouter carpus. Female pleopod simple and not characteristic. Endopod of uropod looks three-segmented but it might be really two-segmented? Telson lanceolate with a pair of statocysts.

*Material examined:* 1♀ (7.9 mm in body length), among the foldfast of *Undaria pinnatifida*, Higashi-tarumi, Kōbe City, Hyōgo Pref. coll. Y. Shibata, May 21, 1961. The specimen is deposited at the Osaka Museum of Natural History, (OMNH-Ar-165).

#### Family PARANTHURIDAE

Two new species of the genus *Paranthura* and a new species of the genus *Colanthura* are included in the present collection.

#### *Colanthura nigra*, n. sp. (Figs. 4-5)

(Japanese name: Kuro-ashitarazu-uminanafushi)

*Description:* Body rather small, not so slender with the length except both antennae about seven to eight times of the width. Body color black all over the body surface other than the peraeopods, marsupia, eggs and both antennae except the basal part. Rostral pro-

Fig. 4. *Colanthura nigra*, n. sp.

- A. Dorsal view of holotype female.
  - B. Lateral view of paratype female.
  - C. Dorsal view of paratype female.
  - D. Mandible.
  - E. First maxilla.
  - F. Maxilliped.
  - G. First antenna.
  - H. Second antenna.
  - I. Exopod of uropod.
  - J. Endopod of uropod.
  - K. Telson.
- (A and D-K, female holotype; B and C, female paratype, coloration is abbreviated).

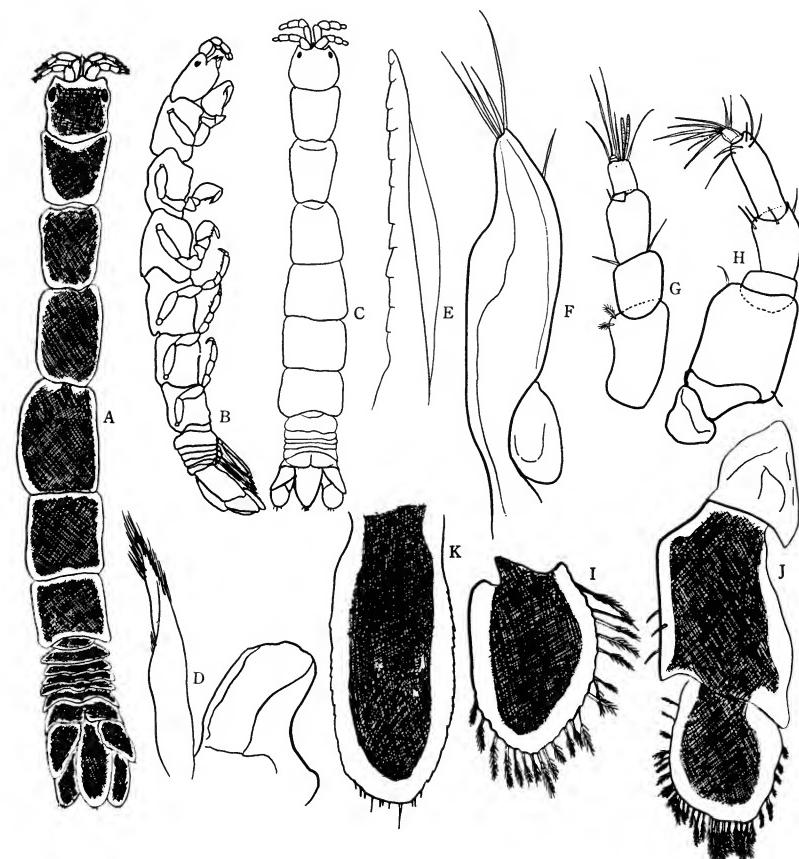
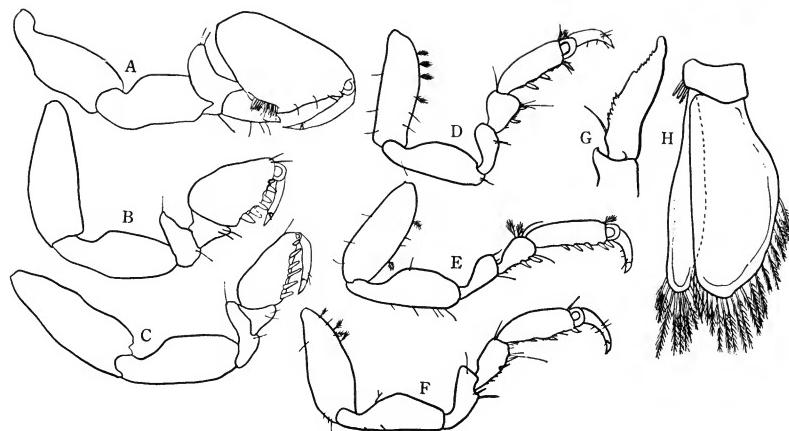


Fig. 5. *Colanthura nigra*, n. sp.

- A-F. Peraeopods I-VI.
  - G. Serrated spine of propodus of fourth peraeopod.
  - H. First pleopod of female.
- (A-H, holotype female).



jection equally in extent as anterolateral angles of cephalon. Eyes not so big with ten to fifteen ocelli. Peraeonal somites I-VI are similar in length. Seventh peraeonal somite very small and seventh pair of peraeopods lacking. Demarcation of pleonal somites completely visible in dorsal view. First somite about three times as long as the second. Second to fifth somites are similar in length. Sixth somite about twice as long as the fifth and with a median cleft at the posterior border. Telson lanceolate and somewhat elongated, without statocyst. Endopodite of uropod a little extending beyond the telson. Mouthpart suited for sucking.

First antenna composed of four-segmented peduncle and a flagellum. First segment big and rectangular. Fourth segment very small and only partly separated from the third. Flagellum composed of one big basal segment and two very small segments at the tip.

Second antenna, longer than the first, composed of six-segmented peduncle and a flagellum. Flagellum is about one-fifth the length of the sixth peduncular segment and considerably narrower than the sixth.

Mandible much reduced. Palp, lacina, incisor and molar process are not observed.

First maxilla long with ten to eleven sawlike teeth at the tip.

Maxilliped composed of only one free segment.

Peraeopods I-III subchelate. Peraeopod I is stoutest, propodus with a row of ten setae near the inner basal part. Peraeopod II and III are similar in shape, each propodus with six stout setae on the inner margin.

Peraopods IV-VI are normal walking legs. Propodus and carpus with two to five serrated stout setae on inner border.

Pleopod I of female with exopod and narrow endopod. Pleopods II-V are similar in shape in female.

Exopod of uropod with somewhat rigged margin. Endopod of uropod composed of rectangular basal segment and round distal segment. Holotype female with a marsupium extending from the posterior 1/3 part of second segment to the central part of the seventh somite, bearing eleven oval eggs.

*Habitat:* Specimens were collected among the algal colonies, 2 m deep and several meters off the shore line. The substratum is rocky with sandy area in the neighbourhood, and pretty dirty with trashes such as skeletons of fishes and discarded empty can or plastic materials.

*Materials examined:* 5♀ (1♀ holotype, 6.0 mm in body length and 4♀ paratypes, 2.3 mm-3.0 mm in body length), the coast of Nakamura, Hokutan-chō, Awaji Island, Hyōgo Pref. coll. N. Nunomura, July 8, 1973. Type series is deposited at the Osaka Museum of Natural History, holotype female, OMNH-Ar-166; paratypes, OMNH-Ar-167.

*Remarks:* As to the genus *Colanthura*, only two species have hitherto been reported as valid; *C. tenuis* RICHARDSON from Bermuda and *C. squamossima* MENZIES from California.

The present new species resembles more closely to *C. squamossima* but differs from the latter by the following points: (1) black body, (2) shape of sixth pleonal somite, and (3) shape of uropod.

***Paranthura laticauda*, n. sp. (Figs. 6–7)**

(Japanese name: Obiro-uminanafushi)

*Description:* Body, dull yellow with black patterns on the dorsal side, rather slender, about eleven times as long as wide except both antennae. Eyes rather big, number of ocelli

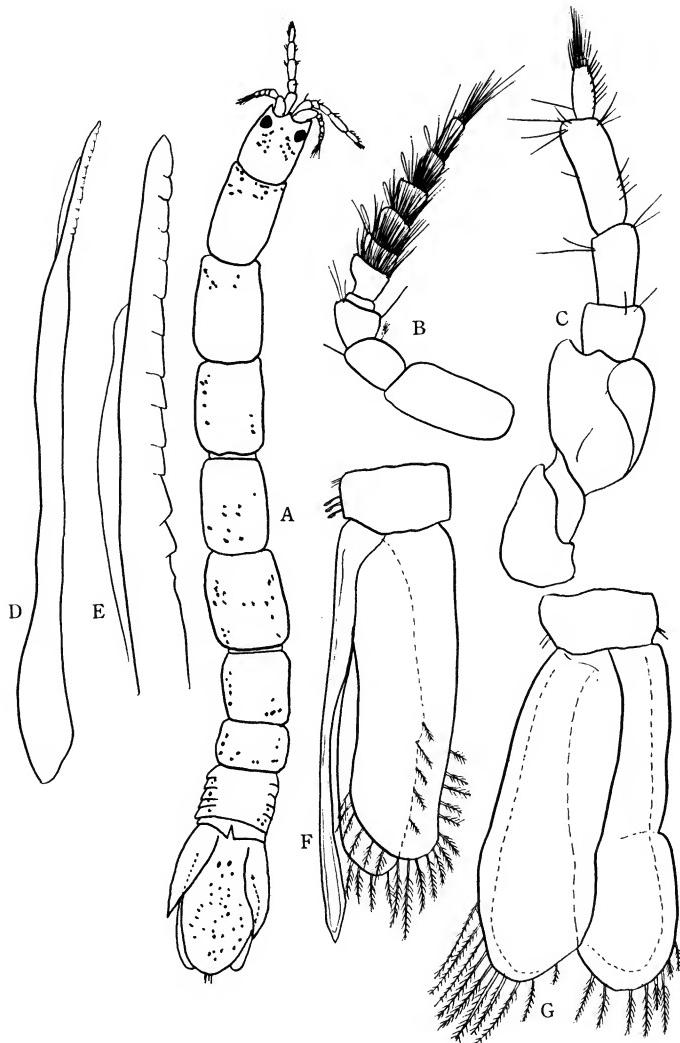


Fig. 6. *Paranthura laticauda*, n. sp. A. Dorsal view. B. First antenna. C. Second antenna. D. First maxilla. E. Tip of first maxilla. F. Second pleopod of male. G. Third pleopod of male.

not discerned. Rostral projection extended equally forward as cephalonic anterolateral angles. Peraeonal somites I-V are similar in length. Sixth somite is about two-third the length of the fifth. Seventh somite is about half the length of the fifth. Demarcation of pleonal somites visible in dorsal view but fused in medial part. First to fifth somites are similar in length. Sixth somite is low triangular in shape with a cleft in posterior border. Telson rather wide and lanceolate. No dorsal pit.

First antenna composed of at least 11 segments. First segment big and elongated. Second and third segment about half the length of the first. Fourth is much shorter than the third. Fifth to last segments with many setae and aesthetascs on the outer surface.

Second antenna somewhat longer than the first and with six-segmented peduncle and a flagellum. First segment triangular and covers the second. Third segment is widest with a crevice. Fourth segment is almost square with two setae. Fifth segment rectangular with four setae. Sixth segment almost rectangular with 13 setae. Flagellum composed of a single setiferous clavate segment bearing about three small indistinct segments at the tip.

Mandible with three-segmented palp. First segment small and square in shape. Second segment long, with a big seta at outer side. Terminal segment with a row of eleven setae on

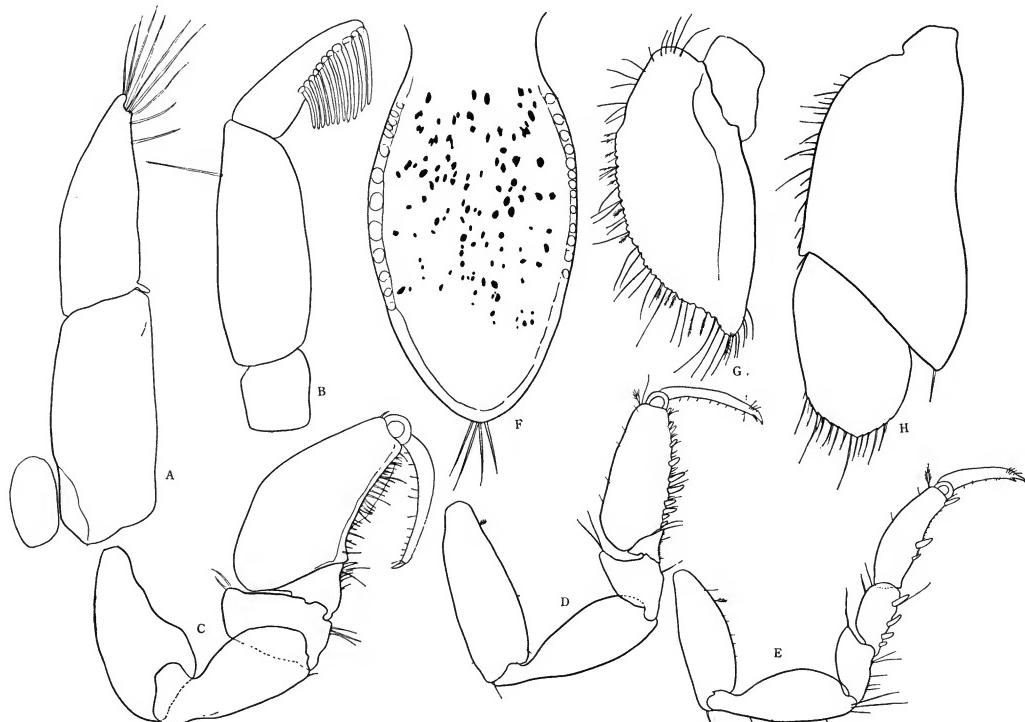


Fig. 7. *Paranthura laticauda*, n. sp. A. Maxilliped. B. Mandibular palp. C. First peraeopod. D. Second peraeopod. E. Fourth peraeopod. F. Telson. G. Exopod of uropod. H. Endopod of uropod.

inner border.

First maxilla long with twelve sawlike teeth on inner border and a fin-shaped structure on outer border of apical part.

Maxilliped with two free segments. First segment almost rectangular. Terminal segment, tapering to the tip, bears about nine setae.

Peraeopods I-III subchelate. Propodus of peraeopod I very big and equipped with many setae on inner margin. Propodus of peraeopod II with eleven stout setae and propodus of peraeopod III with nine stout setae at inner border.

Peraeopods IV-VII are all walking legs and similar in shape. Basis fusiform. Ischium oblong. Merus somewhat elongated and triangular with several setae and many fine setae on inner border and a long seta at outer distal corner. Carpus rectangular with three to four stout setae at inner border. Propodus long with three stout setae and many fine setae on inner border.

Second pair of pleopods of male with spearhead-shaped long stylus.

Exopod of uropod with rather sinuate border and with about 40 simple setae and about fifteen small plumose setae. Endopod of uropod extended as backward as the telson. Terminal segment rounded with about 20 simple setae. Basal segment widened toward the terminal part and with many setae at the tip and a seta at outer tip. Telson very wide.

*Material:* 1♂ (holotype, 12.0 mm in body length), among the colonies of calcareous algae, intertidal zone of Jyōgasaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, Mar. 8, 1974. Type specimen is deposited at the Osaka Museum of Natural History, OMNH-Ar-169.

*Remarks:* The present new species resembles to *Paranthura japonica* RICHARDSON 1906. But the former differs from the latter by the following features: (1) broad telson, (2) bigger eye, (3) less numerous sawlike teeth of first maxilla, (4) weakly projected lateral angles of cephalon, (5) well developed flagella of first antenna, (6) shape of stylus of male second pleopod.

***Paranthura kobensis*, n. sp. (Figs. 8-9)**

(Japanese name: Kōbe-uminanafushi)

*Description:* Body, whitish dull yellow with irregular small pathes in alcohol, slender, about eleven times as long as wide except both antennae. Anterolateral angles exceed rostral projection. First six peraeonal somites similar in length. Seventh somites about half the length of the sixth. No dorsal pit. Eyes rather large. Demarcation of pleonal somites visible in dorsal view and fused in medial part. Sixth somite with a narrow median cleft and a pair of shallow bends on both sides.

First antenna with four-segmented peduncle. First segment oblong. Second segment square. Third segment oblong. Fourth segment small and immersed. Flagellum consists of four segments with an aesthetasc. Distal segment very small.

Second antenna consists of six segments. First segment triangular. Second segment big and grooved. Third and fourth almost square. Fifth segment rectangular with about six setae at distal part. Flagellum oblong, its tip seems seemingly weakly segmented.

Mandible with an acute apex and three-segmented palp. First segment of palp square. Second segment oblong with a seta near at the tip. Terminal segment with a row of ten setae on inner border.

First maxilla slender with fifteen sawlike teeth near at the apex of outer lobe.

Maxilliped with two free segments, each rather slender, but distal one with six setae near at the tip and a seta at the basal part.

Peraeopods I-III subchelate. Peraeopod I stouter than the other. Propodus especially stout and with many setae on the inner margin. Propodus of peraeopods II and III with ten stout setae on inner margin.

Peraeopods IV-VII are all walking legs. Basis and ischium oblong. Merus triangular with many short hairs on inner margin. Carpus oblong with three stout setae and many hair in inner border. Propodus, elongated and longer than carpus, also with three setae and many small denticles.

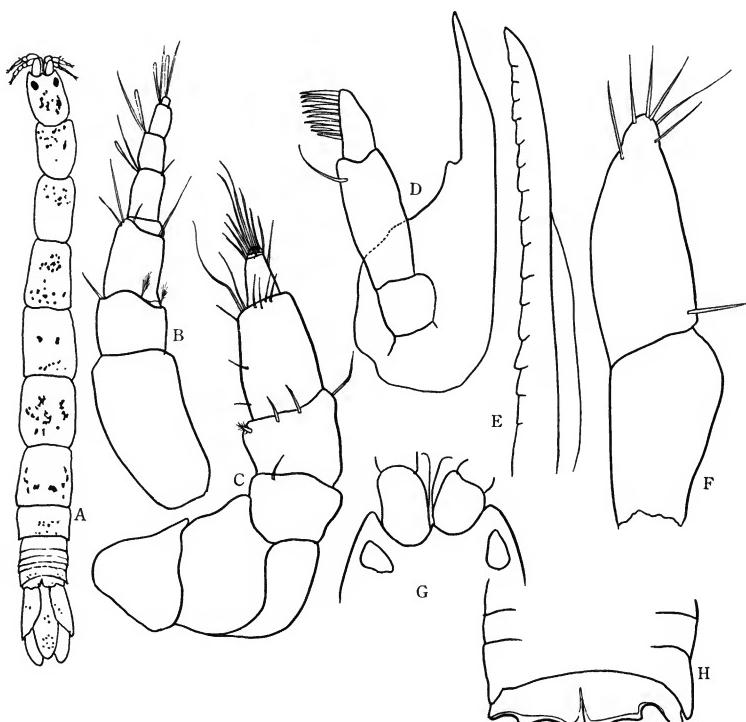


Fig. 8. *Paranthura kobensis*, n. sp. A. Dorsal view. B. First antenna. C. Second antenna. D. Mandible. E. First maxilla. F. Maxilliped. G. Anterior part of cephalon. H. posterior Part of pleon. (A-H, holotype female).

Pleopods not characteristic in female.

Endopod of uropod two-segmented. Basal segment rectangular with a plumose seta at distal outer end. Exopod egg-shaped with rather sinuate margin.

Telson lanceolate with sinuate border and about eight simple setae near at the tip.

*Materials examined:* 2♀ (1♀ holotype, 9.3 mm in body length and 1♀ paratype, 5.0 mm in body length), littoral zone, Takinochaya, Tarumi, Kōbe City, Hyōgo Pref. coll. Y. Shibata, Mar. 28, 1960. Type series is deposited at the Osaka Museum of Natural History, holotype female, OMNH-Ar-170; paratype OMNH-Ar-171.

*Remarks:* The present new species is apparently allied to *P. laticauda*, already described in the present paper, but the former differs from the latter by the following features: (1) narrower telson, (2) shape of pleonal somites, especially sixth somite, (3) more numerous sawlike teeth of first maxilla, (4) shape of both antennae, (5) shape of both uropods.

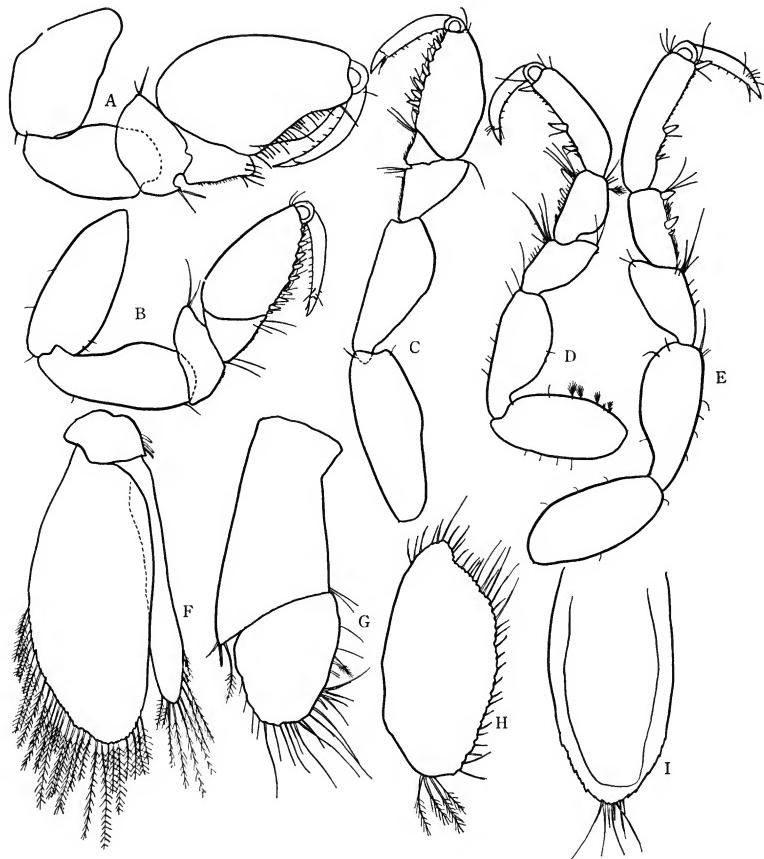


Fig. 9. *Paranthura kobensis*, n. sp. A. First pereaeopod. B. Second pereaeopod. C. Third pereaeopod. D. Fifth pereaeopod. E. Sixth pereaeopod. F. First pleopod of female. G. Endopod of uropod. H. Exopod of uropod. I. Telson.

With regard to the taxonomy of Japanese Anthuridea, *Paranthura japonica* RICHARDSON had long been the only species in Japan and the original description of this species was very inadequate. Recently I described three new species (NUNOMURA, 1974 a & b), two of them belonging to the genus *Paranthura*, but they were rather different from *P. japonica* at least so far as the external features are concerned.

In this paper, I described two new species of the genus *Paranthura*, both of which resembled the inadequately described species, *P. japonica* so much that I could not properly identify them at the first stage of my study. Through the courtesy of Dr. T.E. BOWMAN, I was given a good chance to reexamine the type specimen of *Paranthura japonica* (U.S. Nat. Mus. 39497) and other specimens of this species (U.S. Nat. Mus. 86334) deposited at the U.S. National Museum. I would like here to redescribe this species as follows.

***Paranthura japonica* RICHARDSON, 1906 (Figs. 10–12)**  
(Japanese name: Yamato-uminanafushi, new)

*Redescription of the type specimen:* Body slender: 10.7 mm long, and about twelve times as long as wide except both antennae. Body color dull yellow in alcohol and no distinct black marking was noticed. Eyes orange-colored in alcohol, rather large, rounded triangular and placed in the anterolateral angles, ocelli about ten. Anterolateral angles rather strongly projected and exceedingly forward than rostral projection.

First five pereaeonal somites are similar in length. Sixth somite is half the length of the fifth. Seventh somite is again half the length of the sixth. Demarcation of pleonal somites visible in dorsal view, but fused in medial part. Peraeopods I-III are subchelate. Peraeopod I is stoutest, especially propodus is big. Propodus of pereaeopods II and III with seven to nine stout setae on inner border.

Peraeopods IV-VII are all normal walking legs and all are similar in shape. Telson lanceolate with several setae at the tip, without statocyst. Marsupium was burst out, but 26 eggs were counted.

This specimen was collected at Mororan (Muroran?) during the navigation of the "Albatross" on July 6, 1906.

*Description of a male specimen from the U.S. National Museum Collection:* Body slender, 9.2 mm long and about eleven times as long as wide except both antennae. Body color dull yellow in alcohol but any irregular spot is not found. Eyes rather large, rounded triangular in shape and orange-colored with about ten ocelli, placed in the anterolateral angles. The first five pereaeonal somites are subequal in length. The sixth somewhat shorter than the fifth. The seventh is half the length of the sixth.

First antenna composed of eight segments. First segment big and elongated. Second and third segments are subequal in length. Fourth segment is somewhat shorter than the second or third. Fourth to the last segments with aesthetascs at the tip.

Second antenna six-segmented and longer than the first. Second segment elongated. Third and fourth segments rather small. Fifth segment is about one and half times as long as the fourth. Flagellum consists of single segment furnished with many hairs.

Mandible with three-segmented palp. Second segment of palp with a seta on inner side. The last segment with a row of eleven setae on inner border.

First maxilla with about fifteen sawlike teeth on inner border of apical part.

Maxilliped with two free segments. First segment with protruded inner distal corner. Terminal segment tapering to the tip and with about nine setae.

Peraeopods I-III subchelate. Peraeopod I very big and equipped with many hairs on inner margin but carpus seems to be relatively smaller in male than in holotype female.

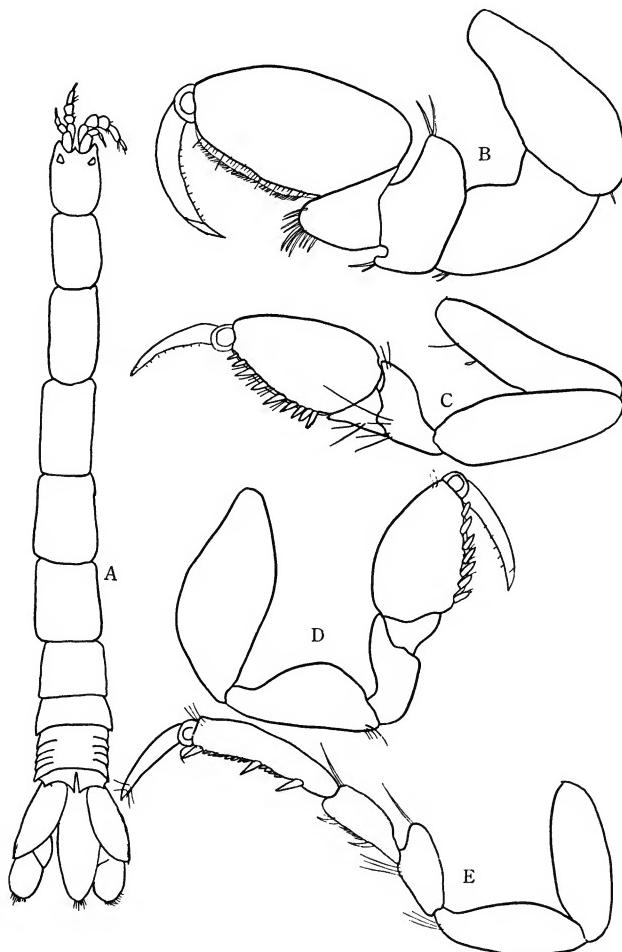
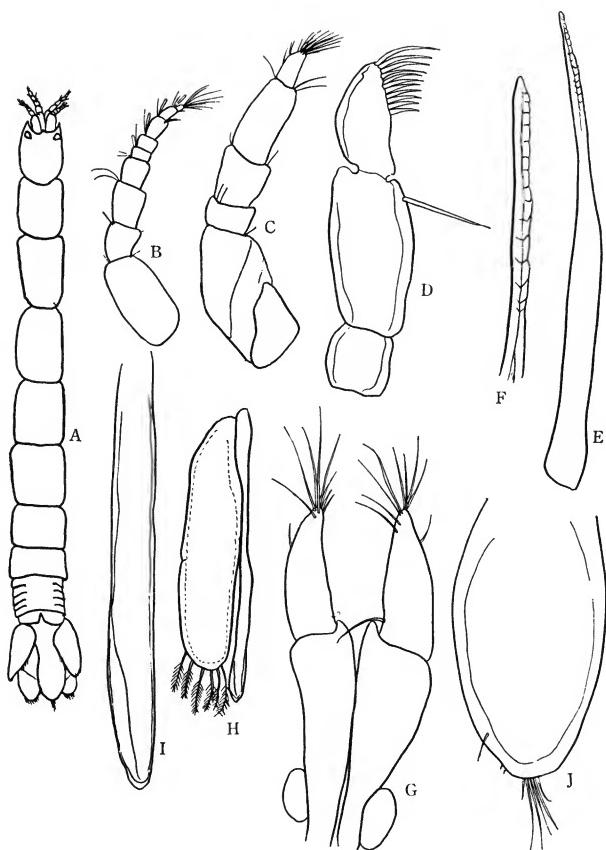
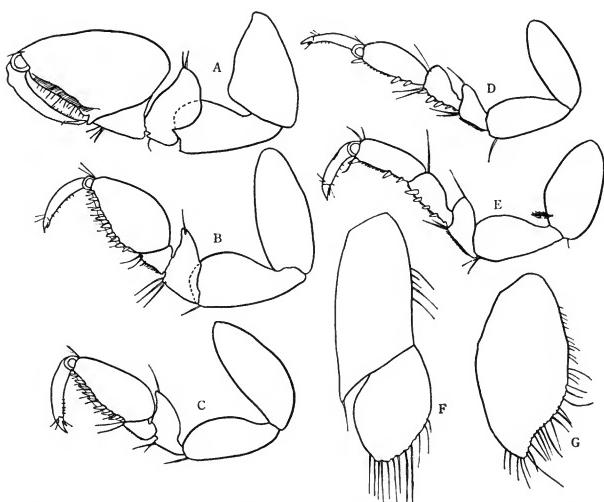


Fig. 10. *Paranthura japonica* RICHARDSON A. Dorsal view. B. First peraeopod. C. Second peraeopod. D. Third peraeopod. E. Seventh peraeopod.  
(A-E, holotype female)

Fig. 11. *Paranthura japonica* RICHARDSON

A. Dorsal view. B. First antenna. C. Second antenna. D. Mandibular palp. E. First maxilla. F. Apical part of first maxilla. G. Maxilliped. H. Second pleopod of male. I. Stylus of second pleopod of male. J. Telson  
(A-J, male U. S. Nat. Mus. 86334)

Fig. 12. *Paranthura japonica* RICHARDSON A-E. Peraeopods I-V. F. Endopod of uropod. G. Exopod of uropod.  
(A-G, male U. S. Nat. Mus. 86334)

Propodus of peraeopod II with nine stout setae at inner border. Peraeopod III with eight setae at inner border.

Second pleopod of male with rather long stylus whose tip clublike shaped.

Exopod of uropod with about thirty-five simple setae and rather sinuate border. Endopod of uropod with almost round last segment and rectangular first segment. Telson rather wide and lanceolate.

This specimen was collected from tidal zone of Petrov Island, Japan Sea, by Dr. E. GURJANOVA in Sep. 1934 and deposited in the U. S. National Museum (U. S. Nat. Mus. 86334), formerly identified with *P. japonica* by Dr. J. I. MALORRY.

#### Family PARASTENETRIDAE

So far as I am aware, only two species of this family have been reported as valid from the Mediterranean Sea. In this paper, a new species of the genus *Caecostenetroides* is described from Osaka Bay as the first record of the family from the Pacific Ocean.

*Caecostenetroides nipponicum*, n. sp. (Figs. 13–14)  
 (Japanese name: Nippon-menashi-hosomizumushi)

*Description:* Body, whitish dull yellow in alcohol, slender, about eleven times as long as wide. Cephalon somewhat elongated. Eye lacking. Thoracic segments I–VII subequal both in length and width. Without distinct epimera bearing a spine. Pleon consists of first two small segments and a big third segment.

First antenna short with five segments. First segment big with a stout seta at distal end. Second segment shorter and slender than the first with two stout setae. Third and fourth segments slenderer and shorter than the second. Distal segment short and square in shape with four setae and two aesthetascs.

Second antenna unfortunately broken. But basal four segments of both sides were left safely. First and second segments short. Third segment longer, being about three times as long as the second and bears a oblong projection with three setae. Fourth segments very small.

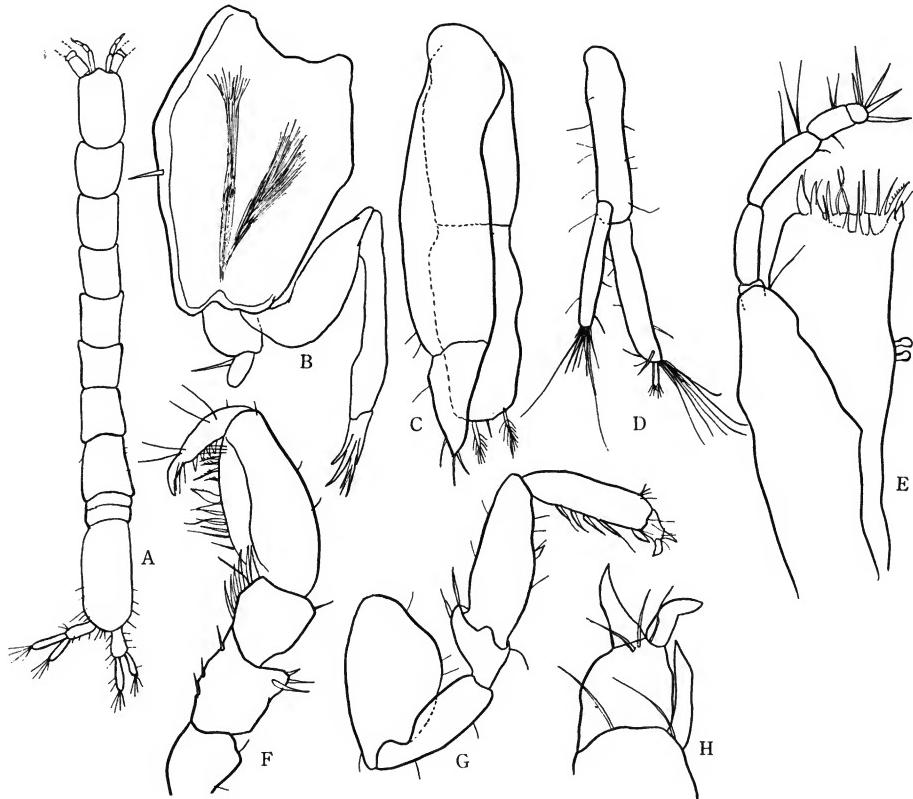


Fig. 13. *Caecostenetroides nipponicum*, n. sp. A. Dorsal view. B. Second pleopod. C. Third pleopod. D. Uropod. E. Maxilliped. F. First pereopod. G. Fourth pereopod. H. Dactylus of fourth pereopod. (A-H, holotype male).

Mandible with five-toothed pars incisiva. Lacina mobilis with two teeth. Spine-row with four spines. Processus molaris consists of an elongated projection with five-toothed apex. Palp three-segmented. First segment small and naked. Second segment long with two setae. Third segment almost as long as the second but wider with a row of about eleven setae at inner border and about four setae near tip.

First maxilla normal. Outer lobe with eight to ten strong pectinate spines. Inner lobe shorter and narrower with many short setae and a stout setae at the tip.

Second maxilla normal. Outer two lobe sub-equal in length and width, both having four long pectinate spines and three to four setae. Inner lobe with five pectinate spines at the tip, seven setae near at the tip and four bigger setae on inner border.

Maxilliped with five-segmented palp. First segment seems to be short. Second and third segments oblong. Fourth segment about half the length of the third. Fifth segment round and small with five stout setae. Anterior margin has some short and robust setae.

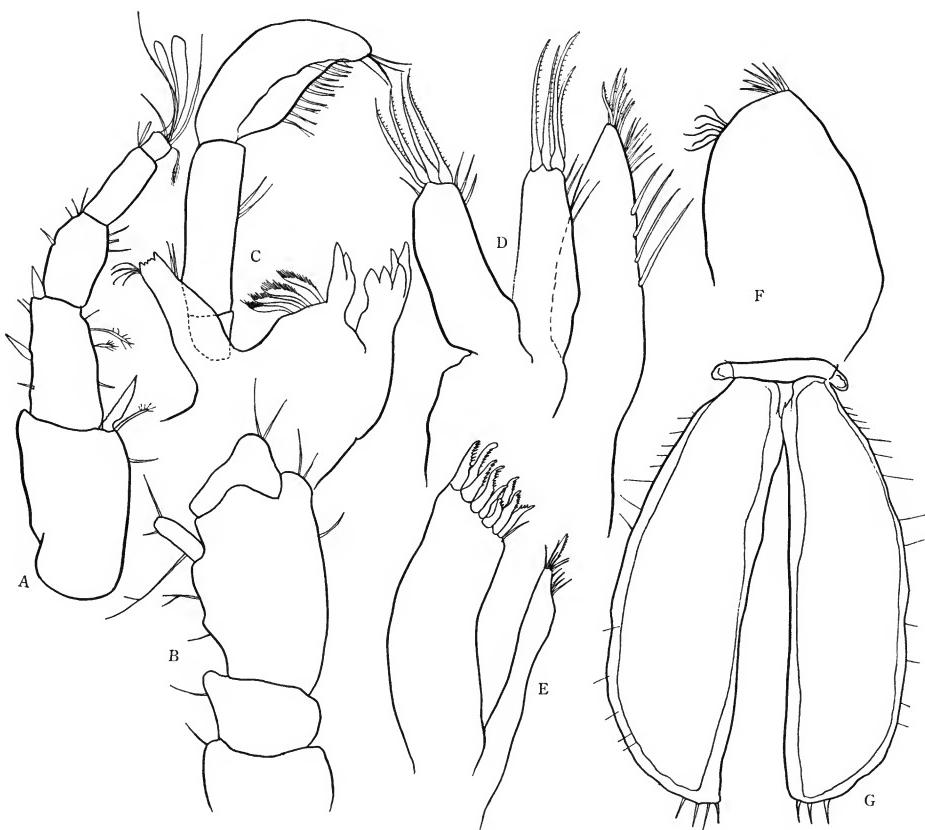


Fig. 14. *Caecostenetroides nipponicum*, n. sp. A. First antenna. B. Basal part of second antenna. C. Mandible. D. Second maxilla. E. First maxilla. F. Lower lip. G. First pleopod. (A-G, holotype male).

Two coupling hooks on the inner border. Epipodite ellipse, not reaching the articulation between the first and second segments of the palp. Lower lip normal, with two groups of setae.

First pair of peraeopods subchelate. Merus and carpus rectangular. Propodus rather stout with several pectinate spines. Dactylus with four stout spines on inner side and a big claw at the tip.

Peraeopods II-VII are all normal walking legs. Dactylus short with two curved claws.

Pleopod I with very small sympod and big exopod, covering the whole ventral part of the pleotelson. Exopod semi-circular and with three to four setae near the tip.

Pleopod II of male with a two-segmented short exopod and a long endopod. Exopod consists of rectangular basal segment and small rounded distal segment. Distal segment with a seta on the outer margin of the distal segment. Endopod long with some denticulations at the tip.

Uropod biramous, half the length of the pleotelson, sympod rectangular, a little longer than the endopod, bearing some setae. Endopod a little longer than exopod.

*Material examined:* 1♂ (holotype, 3.2 mm in body length), intertidal zone of Nagasaki-kaigan, Misaki-chō, Osaka Pref. coll. Y. Shibata, June 4, 1959. Type specimen is deposited at the Osaka Museum of Natural History (OMNH-Ar-172).

*Remarks:* Hitherto only one species of this genus, *Caecostenetroides ischitanum* FRESI and SCHIEKE 1968 has been reported as valid from the Bay of Naple, Italy. The newly described species resembles that species but differs by the following points: (1) lack of epimera bearing short spine directed anteriorly, (2) shape of first antenna, (3) shape of mandible, especially of processus molaris, (4) shape of maxilliped, especially of palp and number of coupling hooks, (5) shape of first peraeopod, (6) shape of male second pleopod, especially of exopod and tip of endopod, (7) more numerous setae of uropod. The present new species is of course the first record from Japan and the Pacific waters.

#### Family JANIRIDAE

##### *Janiroposis longiantennata* THIELEMAN

Specimens: 26 exs. (OMNH-Ar-173), among the colonies of calcareous algae, Jyōgasaki, Wakayama City, Wakayama Pref. coll. Y. Nakajima, Apr. 6, 1974; 4 exs. (Ar-174), Tagurazaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, Mar. 24, 1974; 5 exs. (Ar-175), Ōkawa, Wakayama City, Wakayama Pref. coll. N. Nunomura, Mar. 23, 1974; 50 exs. (Ar-176), Jyōgasaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, Apr. 6, 1974.

#### Family IDOTEIDAE

##### *Synidotea hikigawaensis* NUNOMURA

Specimen: 1 ex. (OMNH-Ar-177), among the brown algae, *Sargassum* sp., Tagurazaki, Wakayama City, Wakayama Pref. coll. K. Seto, Apr. 27, 1975.

*Cleantis planicauda* BENEDICT

Specimen: 1 ex. (OMNH-Ar-178), North coast of Tomogashima, Wakayama City, Wakayama Pref. coll. Y. Shibata, June 8-9, 1959.

*Cleantiella isopus* (GRUBE)

Specimens: 3 exs. (OMNH-Ar-179), Ōkawa, Wakayama City, Wakayama Pref. coll. I. Hamatani, Apr. 20, 1954; 1 ex. (Ar-180), Ōkawa, Wakayama City, Wakayama Pref. coll. I. Hamatani, Aug. 25, 1954; 2 exs. (Ar-181), Ōkawa, Wakayama City, Wakayama Pref. coll. I. Hamatani, Aug. 25, 1954; 3 exs. (Ar-182), Minami-tannowa, Misaki-chō, Osaka Pref. coll. I. Hamatani, July 29, 1958; 2 exs. (Ar-183), Tannowa, Misaki-chō, Osaka Pref. coll. I. Hamatani, Mar. 16, 1960; 1 ex. (Ar-184), Takinochaya, Tarumi, Kōbe City, Hyōgo Pref. coll. Y. Shibata, Mar. 28, 1960; 1 ex. (Ar-185), Takinochaya, Tarumi, Kōbe City, Hyōgo Pref. coll. Y. Shibata, May 13, 1960; 1 ex. (Ar-186), Nagasaki (Misaki-kōen), Misaki-chō, Osaka Pref. coll. Y. Shibata, May 14, 1961; 2 exs. (Ar-187), Toyokunizaki, Misaki-chō, Osaka Pref. coll. Y. Shibata, May 12, 1964; 1 ex. (Ar-188), Tagurazaki, Wakayama City, Wakayama Pref. coll. Y. Fukui, Mar. 24, 1974; 23 exs. (Ar-189), Kada, Wakayama City, Wakayama Pref. coll. N. Nunomura *et al.*, Sep. 16, 1974; 1 ex. (Ar-190), Jyōgasaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, Sep. 30, 1974; 1 ex. (Ar-191), Jyōgasaki, Wakayama City, Wakayama Pref. coll. Y. Nakajima, Feb. 1975.

*Cleantiella strasseni* (THIELEMANN)

Specimens: 1 ex. (OMNH-Ar-192), Takinochaya, Tarumi, Kōbe City, Hyōgo Pref. coll. Y. Shibata, Mar. 28, 1960; 6 exs. (Ar-193), Takinochaya, Tarumi, Kōbe City, Hyōgo Pref. coll. Y. Shibata, May 13, 1960; 1 ex. (Ar-194), Toyokunizaki, Misaki-chō, Osaka Pref. coll. Y. Shibata, May 12, 1962; 1 ex. (Ar-195), Kada, Wakayama City, Wakayama Pref. coll. Y. Fukui, Sep. 16, 1974.

*Synisoma pacificum* NUNOMURA

Specimen: 1 ex. (OMNH-Ar-196), West shore of Tomogashima, Wakayama City, Wakayama Pref. coll. I. Hamatani, July 30, 1954.

## Family TYLIIDAE

*Tylös granulatus* MIERS

Specimens: 4 exs. (OMNH-Ar-197), Higashitarumi, Tarumi, Kōbe City, Hyōgo Pref. coll. Y. Shibata, Aug. 25, 1958; 3 exs. (Ar-213), Yoshimi, Tajiri-chō, Osaka Pref. coll. N. Nunomura, Oct. 10, 1975.

## Family LIGIIDAE

*Ligia exotica* ROUX

Specimens: 1 ex. (OMNH-Ar-198), Ōkawa, Wakayama City, Wakayama Pref. coll. I. Hamatani, Apr. 5, 1954; 1 ex. (Ar-199), Tomogashima, Wakayama City, Wakayama Pref.

coll. I. Hamatani, July 4, 1954; 1 ex. (Ar-200), Ōkawa, Wakayama City, Wakayama Pref. coll. I. Hamatani, Aug. 15, 1954; 2 exs. (Ar-201), Tannowa, Misaki-chō, Osaka Pref. coll. I. Hamatani, Aug. 25, 1958; 4 exs. (Ar-202), Nagasaki, Misaki-chō, Osaka Pref. coll. Y. Shibata, May 11, 1961; 1 ex. (Ar-203), Nakamura, Hokutan-chō, Hyōgo Pref. coll. N. Nunomura, July 3, 1973; 4 exs. (Ar-204), Jyōgasaki, Wakayama City, Wakayama Pref. coll. Y. Inoue, Apr. 6, 1974; 1 ex. (Ar-205), Misaki-kōen, Misaki-chō, Osaka Pref. coll. N. Nunomura, Apr. 21, 1974; 8 exs. (Ar-206), Jyōgasaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, June 2, 1974; 4 exs. (Ar-207), Jyōgasaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, July 22, 1974; 1 ex. (Ar-208), Tannowa, Misaki-chō, Osaka Pref. coll. N. Nunomura, Oct. 12, 1974; 1 ex. (Ar-209), Mouth of Ōtsugawa-river, Tadaoka-chō, Osaka Pref. coll. N. Nunomura. Nov. 14, 1974; 1 ex. (Ar-210), Tomogashima, Wakayama City, Wakayama Pref. coll. N. Nunomura, Nov. 14, 1974; 1 ex. (Ar-211), Atsuhamama, Awaji Is. Hyōgo Pref. coll. N. Nunomura & H. Taruno, Nov. 27, 1974; 8 exs. (Ar-212), Tagurazaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, Mar. 13, 1975.

#### REFERENCES

- AMER, R., 1957. *Gnathostenetroides laodicense* nov. gen. nov. sp. Type nouveau d'Asellota et Classification des Isopodes Aselottes. Bull. Inst. Océanogr. Monaco 1100: 1-10.
- BARNARD, K. H. 1925. A revision of the family Anthuridae (Crustacea Isopoda), with remarks on certain morphological peculiarities. Jour. Linnean Soc. Zool. 36: 109-160.
- FRESI, E. and U. SCHIEKE, 1968. *Caecostenetroides ischitanum* (Isopoda: Parastenetiidae) A new genus and species from the Bay of Naples. Publ. Staz. Zool. Napoli 36: 427-436.
- KUSSAKIN, G. O., 1974. Fauna and ecology of Isopods (Crustacea) from the intertidal zone of the Kurie Islands. Bastitelnyi i Zhivotnyi Mir Litorali Kurilskikh (Ostrovov Sbornik Rabot, Inst. Biol. Moria, Dalnevost. Nauchn. Tsentr. Akad. Nauk SSSR, no. 1): 227-275 (in Russian).
- MENZIES, R. J. 1951. New marine isopods, chiefly from northern California, with notes on related forms. Proc. U. S. Nat. Mus. 101 (3273): 105-156.
- MENZIES, R. J. and P. W. GLYNN, 1968. The common Marine Isopod Crustacea of Puerto Rico. A Handbook for Marine Biologists. Studies Fauna Curaçao 27: 1-133.
- MILLER, M. A. and R. J. Menzies, 1952. The Isopod Crustacea of Hawaiian Islands, III. Superfamily Flabellifera, Family Anthuridae. Occ. Papers B. P. Bishop Mus. 21(1): 1-15.
- NORDENSTAM, Å., 1930. Tanaidaceae and Marine Isopoda from Juan Fernandez. The Nat. Hist. Juan Fernandez and Easter Isl. 3: 525-552, pl. 20.
- NUNOMURA, N. 1974a. Marine Isopoda from the Coast of Hikigawa Town, Kii Peninsula, Middle Japan (I). Bull. Osaka Mus. Nat. Hist. 28: 1-12.
- 1974b. A New Anthurid Isopod from the Estuary of the Muromi river, Northern Kyusyu, Japan. Ibid. 28: 13-16.
- RICHARDSON, H., 1905. Monograph on the isopod of North America. U. S. Nat. Mus., Bull. 54: 1-727.
- , 1906. Isopods collected in the North west Pacific by the U. S. Bureau of fisheries Steamer "Albatross" in 1906. Proc. U. S. Nat. Mus. 37 (1701): 75-129.
- SCHULTZ, G. A. 1969. How to know the Marine Isopod Crustacean. Wm C. Brown Company Publishers, Hampton.
- THIELEMAN, M., 1910. Beiträge zur Kenntnis der Isopodenfauna Ostasiens. K. B. Akademie der Wissenschaften, München.

coll. I. Hamatani, July 4, 1954; 1 ex. (Ar-200), Ōkawa, Wakayama City, Wakayama Pref. coll. I. Hamatani, Aug. 15, 1954; 2 exs. (Ar-201), Tannowa, Misaki-chō, Osaka Pref. coll. I. Hamatani, Aug. 25, 1958; 4 exs. (Ar-202), Nagasaki, Misaki-chō, Osaka Pref. coll. Y. Shibata, May 11, 1961; 1 ex. (Ar-203), Nakamura, Hokutan-chō, Hyōgo Pref. coll. N. Nunomura, July 3, 1973; 4 exs. (Ar-204), Jyōgasaki, Wakayama City, Wakayama Pref. coll. Y. Inoue, Apr. 6, 1974; 1 ex. (Ar-205), Misaki-kōen, Misaki-chō, Osaka Pref. coll. N. Nunomura, Apr. 21, 1974; 8 exs. (Ar-206), Jyōgasaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, June 2, 1974; 4 exs. (Ar-207), Jyōgasaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, July 22, 1974; 1 ex. (Ar-208), Tannowa, Misaki-chō, Osaka Pref. coll. N. Nunomura, Oct. 12, 1974; 1 ex. (Ar-209), Mouth of Ōtsugawa-river, Tadaoka-chō, Osaka Pref. coll. N. Nunomura. Nov. 14, 1974; 1 ex. (Ar-210), Tomogashima, Wakayama City, Wakayama Pref. coll. N. Nunomura, Nov. 14, 1974; 1 ex. (Ar-211), Atsuhamama, Awaji Is. Hyōgo Pref. coll. N. Nunomura & H. Taruno, Nov. 27, 1974; 8 exs. (Ar-212), Tagurazaki, Wakayama City, Wakayama Pref. coll. N. Nunomura, Mar. 13, 1975.

#### REFERENCES

- AMER, R., 1957. *Gnathostenetroides laodicense* nov. gen. nov. sp. Type nouveau d'Asellota et Classification des Isopodes Aselottes. Bull. Inst. Océanogr. Monaco 1100: 1-10.
- BARNARD, K. H. 1925. A revision of the family Anthuridae (Crustacea Isopoda), with remarks on certain morphological peculiarities. Jour. Linnean Soc. Zool. 36: 109-160.
- FRESI, E. and U. SCHIEKE, 1968. *Caecostenetroides ischitanum* (Isopoda: Parastenetiidae) A new genus and species from the Bay of Naples. Publ. Staz. Zool. Napoli 36: 427-436.
- KUSSAKIN, G. O., 1974. Fauna and ecology of Isopods (Crustacea) from the intertidal zone of the Kurie Islands. Bastitelnyi i Zhivotnyi Mir Litorali Kurilskikh (Ostrovov Sbornik Rabot, Inst. Biol. Moria, Dalnevost. Nauchn. Tsentr. Akad. Nauk SSSR, no. 1): 227-275 (in Russian).
- MENZIES, R. J. 1951. New marine isopods, chiefly from northern California, with notes on related forms. Proc. U. S. Nat. Mus. 101 (3273): 105-156.
- MENZIES, R. J. and P. W. GLYNN, 1968. The common Marine Isopod Crustacea of Puerto Rico. A Handbook for Marine Biologists. Studies Fauna Curaçao 27: 1-133.
- MILLER, M. A. and R. J. Menzies, 1952. The Isopod Crustacea of Hawaiian Islands, III. Superfamily Flabellifera, Family Anthuridae. Occ. Papers B. P. Bishop Mus. 21(1): 1-15.
- NORDENSTAM, Å., 1930. Tanaidaceae and Marine Isopoda from Juan Fernandez. The Nat. Hist. Juan Fernandez and Easter Isl. 3: 525-552, pl. 20.
- NUNOMURA, N. 1974a. Marine Isopoda from the Coast of Hikigawa Town, Kii Peninsula, Middle Japan (I). Bull. Osaka Mus. Nat. Hist. 28: 1-12.
- 1974b. A New Anthurid Isopod from the Estuary of the Muromi river, Northern Kyusyu, Japan. Ibid. 28: 13-16.
- RICHARDSON, H., 1905. Monograph on the isopod of North America. U. S. Nat. Mus., Bull. 54: 1-727.
- , 1906. Isopods collected in the North west Pacific by the U. S. Bureau of fisheries Steamer "Albatross" in 1906. Proc. U. S. Nat. Mus. 37 (1701): 75-129.
- SCHULTZ, G. A. 1969. How to know the Marine Isopod Crustacean. Wm C. Brown Company Publishers, Hampton.
- THIELEMAN, M., 1910. Beiträge zur Kenntnis der Isopodenfauna Ostasiens. K. B. Akademie der Wissenschaften, München.